



Superfund At Work

Hazardous Waste Cleanup Efforts Nationwide

Brown Wood Preserving Site Profile

Site Description:

A former wood preserving site
near Live Oak, Florida

Site Size: 55 acres

Primary Contaminants:

Creosote, pentachlorophenol
(PCP), and polycyclic aromatic
hydrocarbons (PAHs)

Potential Range of Health

Risks: Acute toxicity or increased
risk of cancer upon direct expo-
sure

Nearby Population Affected:

450 people within 1/2 mile

Ecological Concerns:

The American alligator

Year Listed on NPL: 1983

EPA Region: 4

State: Florida

Congressional District: 2

Success in Brief

Innovative Technology Used to Restore Environment

At the Brown Wood Preserving site, creosote and other toxic chemicals polluted 55 acres of Suwanee County Florida. These chemicals were used for pressure treating lumber and other wood products for nearly 30 years. Much of the indigenous wildlife disappeared from the area due to progressive soil and surface water contamination. Together with the State of Florida, the U.S. Environmental Protection Agency (EPA) investigated the site and negotiated with facility owners for a comprehensive cleanup. Highlights of the effort included:

- Excavating and solidifying 15,000 tons of creosote sediments and sludge, and treating 200,000 gallons of lagoon water;
- Selecting bioremediation, an innovative technology, to turn hazardous contaminants in soil into harmless by-products; and
- Supervising restoration of the environment, enabling resident plant and animal species to re-inhabit the site.

Cleanup activities costing nearly \$2.8 million were funded by the facility owners under a cooperative settlement agreement, called a consent decree.

The Site Today

Cleanup operations are complete and the area meets federal and state health standards.

Florida environmental officials are monitoring the site to ensure that the area remains safe.

The American alligator and other wildlife have returned to a one-acre pond on the site. When the ground water monitoring period is complete in June 1994, EPA will reassess the effectiveness of the cleanup.



Photo: Dan O'Neal, U.S. Fish & Wildlife Service

Water lilies and cypress trees are among the botanical residents of the pond on the Brown Wood Preserving site.

A Site Snapshot

The 55-acre Brown Wood Preserving site is two miles west of the town of Live Oak in North-Central Florida.

The area surrounding the site is rural, supporting citrus growers and other agriculture. A trailer park for approximately 450 people, homes, businesses, light industry, a private airport, and a county storage yard are located less than one mile from the site. **Four** private wells and the wells for Live Oak's public water supply are less than two miles from the site.

The Brown Wood Preserving site functioned as a wood treatment facility from the mid-1940s until 1978. Operators at

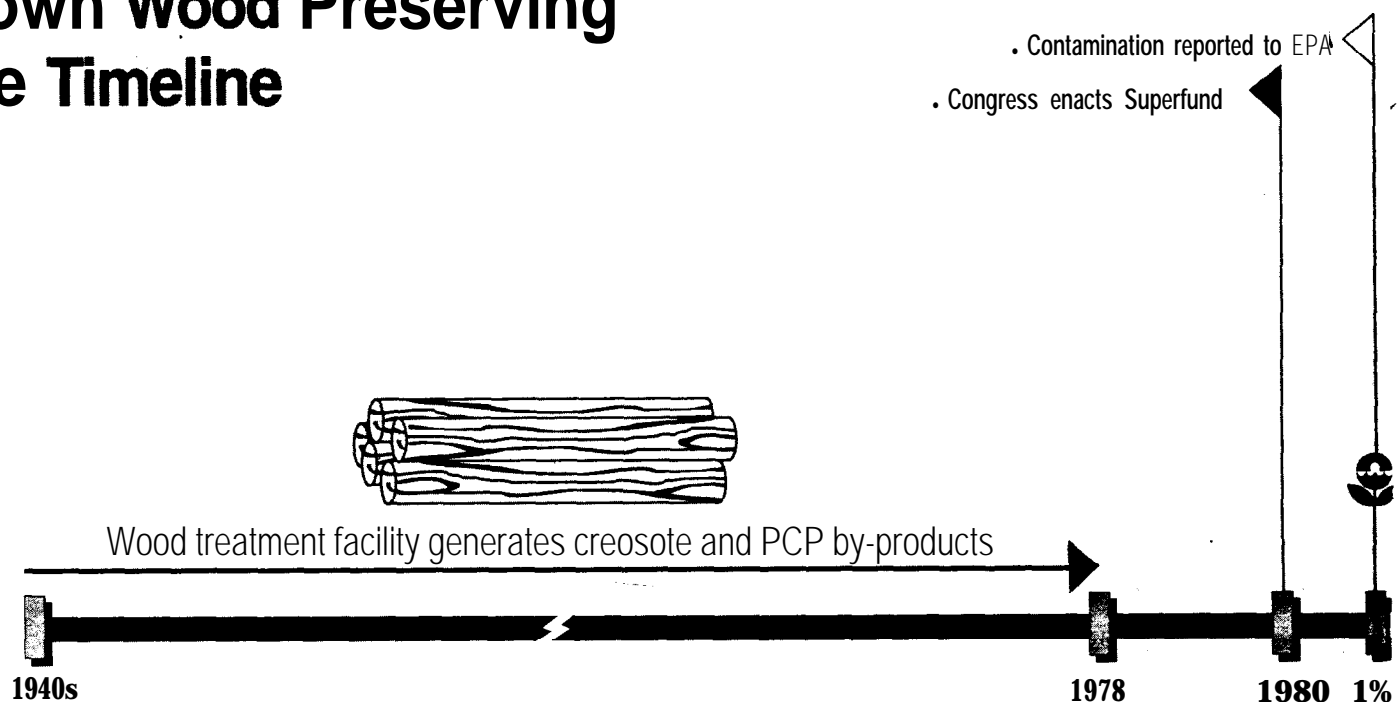
The public water supply for the town of Live Oak is less than two miles from the contaminated site

the facility treated timber with creosote and pentachlorophenol (PCP) and discharged wastewater into an open ditch, where it flowed into a five-acre unlined reservoir. A three-acre lagoon on the site also contained 3,000 cubic yards of creosote wastes.

Creosote by-products, which are polycyclic aromatic hydrocarbons (PAHs), can cause cancer, and PCP is acutely toxic. Worker exposure to contaminated soil, sludges, dusts, and surface waters could have resulted in serious health effects, however, no one has reported any symptoms to the local health authorities.

Nevertheless, while wood treating operations took place, much of the indigenous wildlife disappeared from the area.

Brown Wood Preserving Site Timeline



Wood Preserving Operations Contaminate the Environment

The Brown Wood Preserving facility pressure-treated timber products under a series of owners from 1945 to 1978. The processes of treating, moving, storing, and drying lumber thoroughly contaminated the soil. An on-site lagoon periodically flooded, and stored sludges polluted sandy areas throughout the site.

In 1980, Congress enacted the Superfund law with a primary aim of cleaning up the nation's hazardous waste sites, particularly those like Brown Wood. In 1981, a former facility owner notified EPA of hazardous waste on the site. An inspection by EPA and the Florida Department of Environmental Regulation

(FDER) in 1982 confirmed that contaminated soil, sludge and surface water presented a serious environmental threat. In 1983, EPA added the site to the National Priorities List (NPL), a

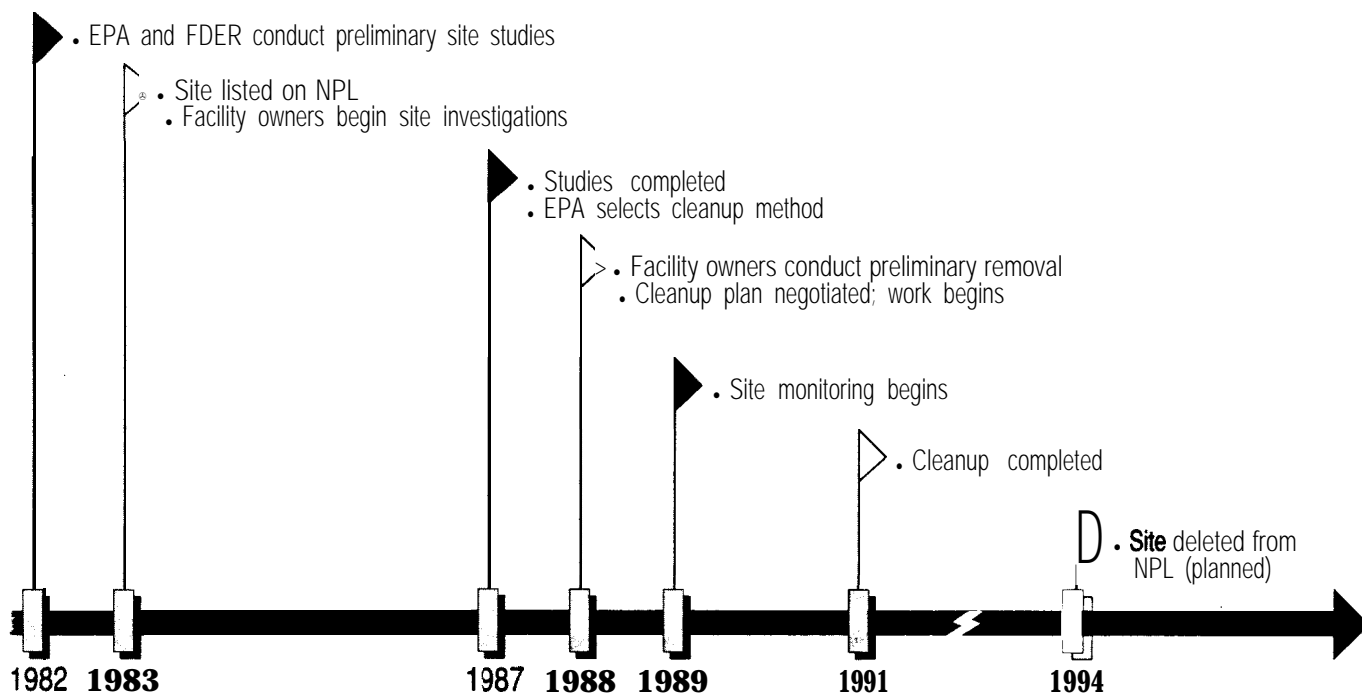
Contaminated soil, sludge, and surface water presented a serious environmental threat

roster of hazardous waste sites eligible for cleanup under the Superfund program.

Preliminary site studies to identify the extent of the contamination began later that year. EPA

and FDER jointly tested neighboring private wells and took samples from various locations on site. These samples showed that hazardous chemicals had polluted surface water and soil, but had not affected the ground water.

Later in 1983, EPA investigated and issued notices to companies and individuals who had contributed wastes to the site. EPA negotiated with these parties to conduct studies to determine long-term cleanup alternatives. Sampling and investigations continued at the site until 1986 under a consent order with the Brown Wood Foundation and AMEX, two former site owners.



Preliminary Removal Stabilizes Site

Under EPA supervision, the owners then excavated and removed off site 15,000 tons of creosote sediments and sludge and treated 200,000 gallons of lagoon water. Buildings and processing equipment also were demolished and removed at this time, along with an abandoned railroad track. These activities continued from December 1987 through March 1988 and eliminated a large portion of the site contaminants.

EPA Chooses An Innovative Technology for Soil Cleanup

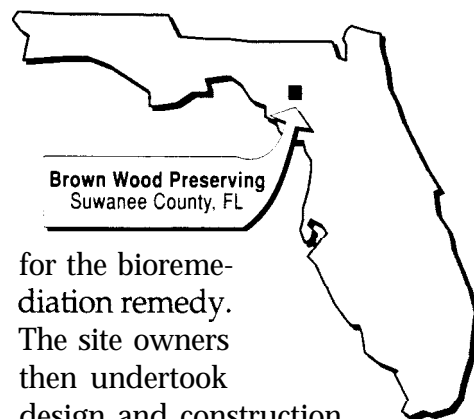
In 1988, EPA selected a plan for comprehensive cleanup from among the alternatives developed by the site owners. The preferred remedy was presented at a public meeting to members of the community who were asked to comment on the cleanup plan.

EPA selected a new technology called bioremediation to treat contaminated soil. In this process, certain bacteria are injected into the soil which "eat" and break down the contaminants into harmless by-products, neutraliz-

Bioremediation uses bacteria to "eat" contaminants, neutralizing their hazardous properties

ing their hazardous properties. Because the site was the first in the state to use this technology, EPA decided to closely monitor the work. If no substantial progress was made to neutralize contaminants within two years, bioremediation would be abandoned in favor of another method.

Once this plan was formally approved, EPA negotiated an agreement called a consent decree

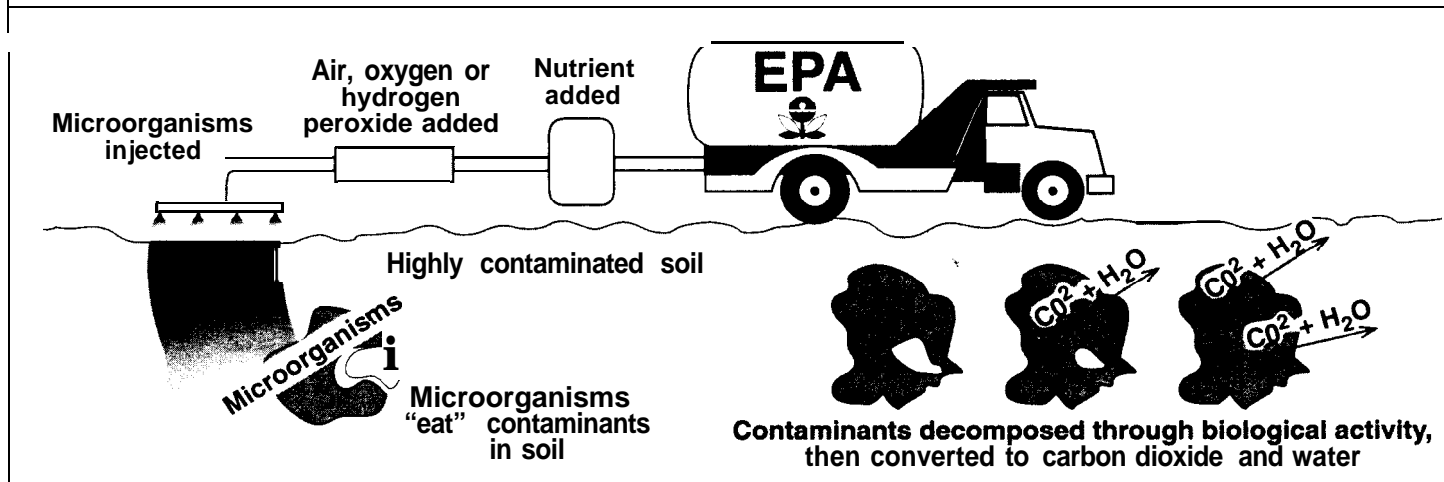


for the bioremediation remedy. The site owners then undertook design and construction activities required to permanently clean up the site.

Engineering designs for the project began in May 1988 and were completed eight months later. Initial activities included erecting a fence and installing a surface drainage network and irrigation system for the treatment area.

The bioremediation method proved successful and soil treatment was completed in 1991. Grasses and plants have grown back over the treatment area. A monitoring system is in place to ensure the continued safety of the aquifer, even though ground water contamination levels remain at acceptable levels.

Bioremediation: Using Bacteria to Neutralize Contaminants



The 'Gators Come Back: Re-Emerging Wildlife Test Cleanup's Effectiveness

The American alligator is found in coastal plains from North Carolina to Texas, inhabiting lowland rivers, lakes, and marshes.

Before human activities disturbed the natural habitat, alligators grew to a maximum length of about 19 feet. The average length of an adult today is only about 9 feet; an alligator this size weighs approximately 250 pounds. Females are about two feet shorter and half the weight of males. Alligators can live up to 50 years.

In spring, the female builds a huge nest in which she lays 30 to 70 eggs. The young emerge two to three months later and are about eight inches long. Alligators hunt at night, the young feeding on insects and small crustaceans, and the adults eating a variety of animals, including snakes, turtles, birds, and muskrats. Widely hunted for its tough and attractive hide, the alligator is at greater risk from loss of marshy habitat through drainage and pollution. The

species' population has been greatly reduced, thus the alligator is protected in the southern United States.

Following the cleanup at the Brown Wood Preserving site, alligators and other creatures began to re-inhabit the ponds on the site, a sure sign of the Superfund program's effectiveness.



Successful Negotiations Result in \$2.8 Million Cleanup

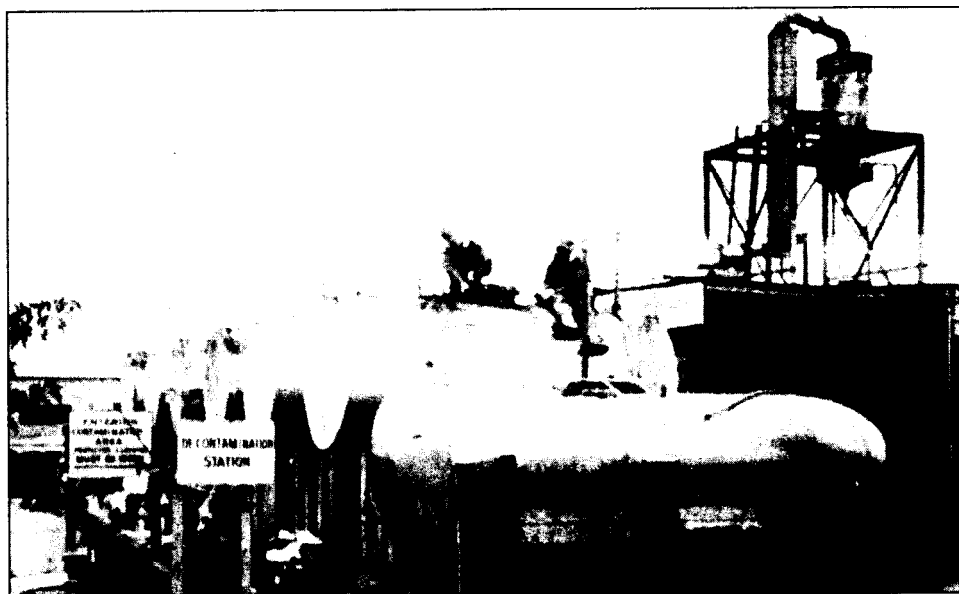
The Superfund program has a primary goal of identifying and locating parties who are responsible for contaminating sites across the nation. Owners, operators, generators, and transporters are liable for cleaning up polluted sites and mitigating any damages to the surrounding environment.

At Brown Wood, EPA negotiators settled with the site owners to undertake field investigations, engineering and remedial activities.

Under EPA oversight, the parties conducted an effective cleanup and continue to monitor the soil and water in conjunction with the State of Florida. In 1994,

EPA will evaluate the effectiveness and permanence of the remedy, including restoration of the site ecosystem to sustain wildlife. The site will be scheduled for deletion from the NPL in 1994, pending the results of this review.

Cleanup Team in Action



Members of the cleanup team examine storage tanks in the Brown Wood site decontamination area.

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Success at Brown Wood Preserving

The Brown Wood Preserving site is a good example of cleanup of a hazardous waste site using private resources.

Through negotiations with parties responsible for contamination at the site, EPA achieved an effective cleanup at minimal cost to the Superfund program.

An innovative technology, called bioremediation, was used to decontaminate the soil. Surface water and surrounding areas have been restored to safe levels.



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